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Title : CHANGES IN REPRODUCTIVE PARAMETERS OF POLAR BEARS: EFFECTS OF CLIMATE CHANGE OR 'SIMPLE' POPULATION DYNAMICS?

Category : Ecology

Student : Not Applicable

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Abstract : Each summer, the population of polar bears in western Hudson Bay is forced ashore during the open water season and fasts for about 4 months (most bears) to 8 months (pregnant bears). For pregnant bears, the amount of fat that they are able to accumulate prior to coming ashore is particularly critical because it is from these fat stores that they meet their own energetic costs and those of their new cubs. From 1980 through 2002, there has been an approximate two-week advance in the date of break-up of sea ice on western Hudson Bay, due to a long-term warming trend in spring atmospheric temperatures. Although we previously documented that progressively earlier break-up was significantly correlated with declining condition of polar bears coming ashore, the subsequent effects on reproduction were unknown. Combining long-term population and climate data, we used general linear models to examine whether (1) any changes in basic reproductive parameters have occurred since the early 1980s and (2) if so, might they be linked to changes in climate. While the mean age of females accompanied by cubs has not changed over time, litter size was affected by YEAR, MATERNAL AGE, and an interaction between YEAR and MATERNAL CONDITION. The proportion of single cub litters has increased whereas twins and triplets have decreased. For most age classes, natality rates declined and inter-birth intervals increased through the mid-1990s but both parameters have since reversed direction. In addition, the proportion of females captured that were accompanied by cubs also declined through the early 1990s but has also increased since then. Although it is clear that the reproductive ecology of polar bears in western Hudson Bay has changed, whether it is directly linked to a changing climate is equivocal.